

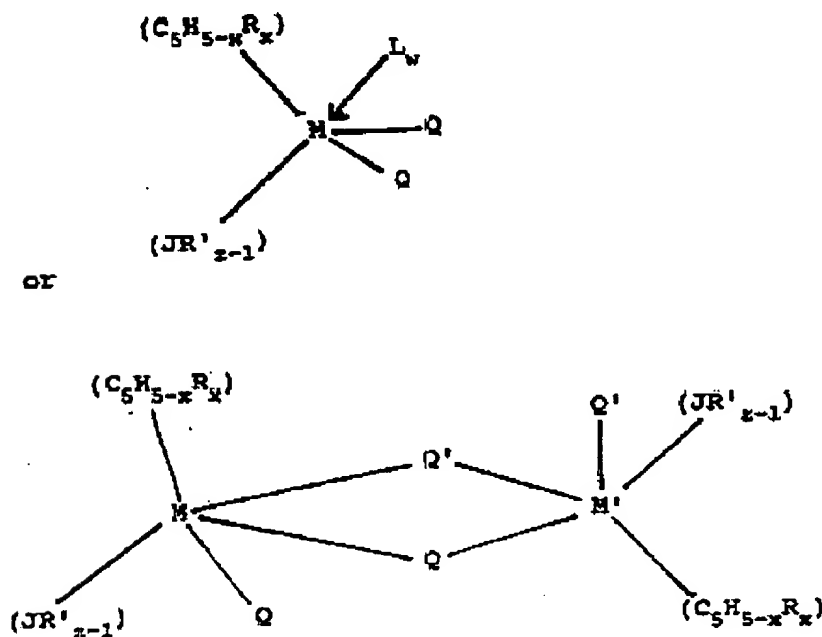
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IN THE CLAIMS

1.-33. (Canceled)

34. (Currently amended) A process for the polymerization of one or more alpha olefins comprising conducting the polymerization in the presence of a catalyst system comprising:

(A) a Group IV B transition metal component of the formula:



wherein "M" is Zr, Hf or Ti;

(C₅H_{5-x}R_x) is a cyclopentadienyl ring which is substituted with from zero to five substituent groups R, "x" is 0, 1, 2, 3, 4 or 5 denoting the degree of substitution, and each R is, independently, a radical selected from a group consisting of C₁-C₂₀ hydrocarbyl radicals, C₁-C₂₀ substituted hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, C₁-C₂₀ hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from

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Group IV-A of the Periodic Table of Elements, and halogen radicals or $(C_5H_{5-x}R_x)$ is a cyclopentadienyl ring in which two adjacent R-groups are joined forming a C_4-C_{20} ring to give a saturated or unsaturated polycyclic

cyclopentadienyl ligand;

(JR'_{z-1}) is a heteroatom ligand in which "J" is an element with coordination number of three from Group V-A or an element with a coordination number of two from VI-A of the Periodic Table of Elements, each "R'" is, independently a radical selected from a group consisting of C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, and "z" is the coordination number of the element "J";

each "Q" is, independently, any univalent anionic ligand or two "Q"'s are a divalent anionic chelating ligand, provided that "Q" is different from $(C_5H_{5-x}R_x)$;

"L" is a neutral Lewis base where "w" is a number greater than 0 and up to 3;

"M'" has the same meaning as "M"; and

"Q'" has the same meaning as "Q"; and

(B) an alumoxane.

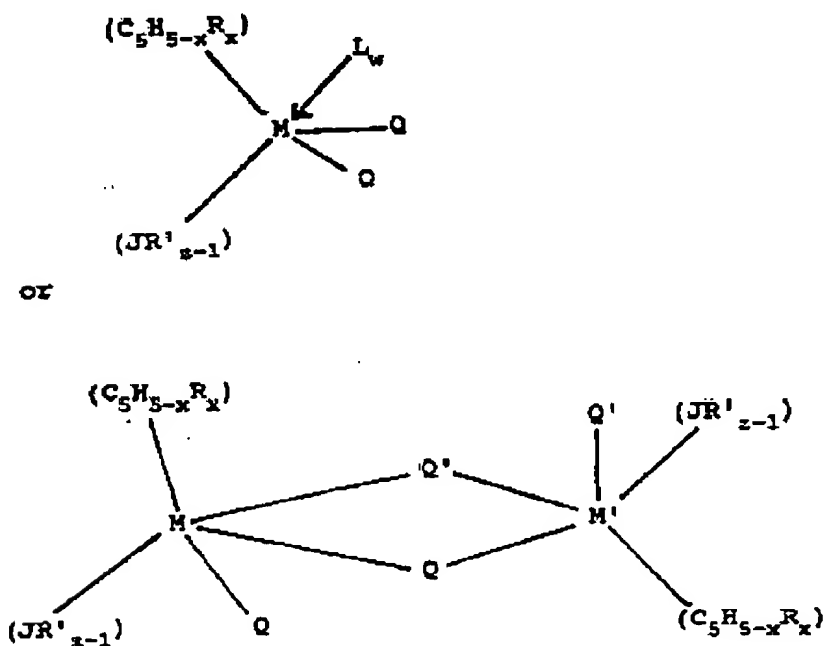
35. (Canceled)

36. (Canceled)

37. (Previously presented) The process of claim 34 wherein the heteroatom ligand group J element is nitrogen, phosphorous, oxygen or sulfur.

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38. (Previously presented) The process of claim 34 wherein Q is a halogen or hydrocarbyl radical.
39. (Canceled)
40. (Previously presented) The process of claim 34 wherein the heteroatom ligand group J element is nitrogen.
41. (Previously presented) The process of claim 34 wherein the mole ratio of Al:M is from 10:1 to 20,000:1.
42. (Previously presented) The process of claim 34 wherein x is 0 or 1.
43. (New) A process for the polymerization of one or more olefins comprising conducting the polymerization in the presence of a catalyst system comprising:
- (A) a Group IV B transition metal component of the formula:



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wherein "M" is Zr, or Hf;

(C₅H_{5-x}R_x) is a cyclopentadienyl ring which is substituted with from zero to five substituent groups R, "x" is 0, 1, 2, 3, 4 or 5 denoting the degree of substitution, and each R is, independently, a radical selected from a group consisting of C₁-C₂₀ hydrocarbyl radicals, C₁-C₂₀ substituted hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, C₁-C₂₀ hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group IV-A of the Periodic Table of Elements, and halogen radicals or (C₅H_{5-x}R_x) is a cyclopentadienyl ring in which two adjacent R-groups are joined forming a C₄-C₂₀ ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand;

(JR'_{z-1}) is a heteroatom ligand in which "J" is an element with coordination number of three from Group V-A or an element with a coordination number of two from VI-A of the Periodic Table of Elements, each "R" is, independently a radical selected from a group consisting of C₁-C₂₀ hydrocarbyl radicals, substituted C₁-C₂₀ hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, and "z" is the coordination number of the element "J";

each "Q" is, independently, any univalent anionic ligand or two "Q"'s are a divalent anionic chelating ligand, provided that "Q" is different from (C₅H_{5-x}R_x);

"L" is a neutral Lewis base where "w" is a number greater than 0 and up to 3;

"M" " has the same meaning as "M"; and

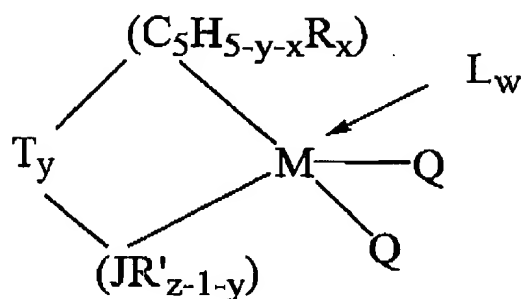
"Q" " has the same meaning as "Q"; and

(B) an alumoxane.

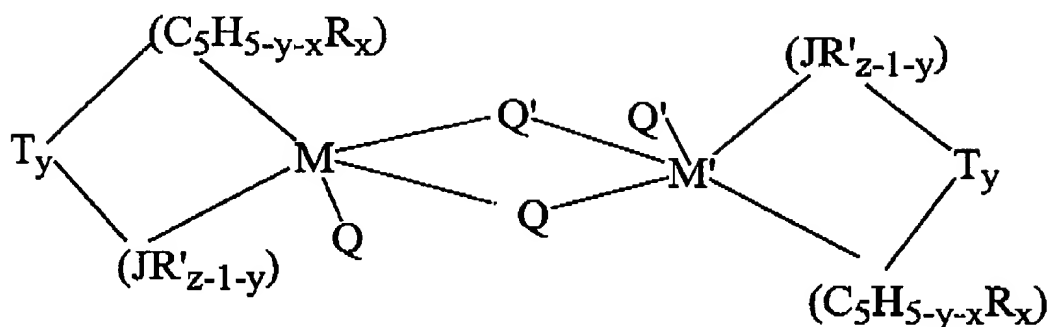
44. (New) A process for the polymerization of one or more alpha olefins comprising conducting the polymerization in the presence of a catalyst system comprising:

(A) a Group IV B transition metal component of the formula:

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or



wherein M is Zr or Hf;

M' has the same meaning as M;

(C₅H_{5-y-x}R_x) is a cyclopentadienyl ring which is substituted with from zero to five substituent groups R, x is 0, 1, 2, 3, 4 or 5 denoting the degree of substitution, and

each substituent group R is, independently, a radical selected from the group consisting of C₁-C₂₀ hydrocarbyl radicals, substituted C₁-C₂₀ hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, C₁-C₂₀ hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from the group IV A of the Periodic Table of Elements, and halogen radicals, or (C₅H_{5-y-x}R_x) is a cyclopentadienyl ring in which two adjacent R-groups are joined forming a C₄-C₂₀ ring to give a saturated or unsaturated polycyclic ligand;

(JR'_{z-1-y}) is a heteroatom ligand in which J is an element with a coordination number of three from group V-A or an element with a coordination number of two from Group VI-A of the Periodic Table of Elements, and each R' is a radical selected from the group consisting of C₁-C₂₀ hydrocarbyl radicals, substituted C₁-C₂₀ hydrocarbyl radicals where one or more hydrogen atoms is replaced by a halogen radical, and z is the coordination number of the element J;

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each Q is, independently, a univalent anionic ligand or two Q's together are a divalent anionic chelating ligand, provided that Q is different from $(C_5H_5-xR_x)$;

Q' has the same meaning as Q;

y is 1 when w is greater than 0; T is a covalent bridging group containing a Group IV-A or V-A element; and

L is a neutral Lewis base where w denotes the number 0 or 1, and when w is 0 y is 1.

"M' " has the same meaning as "M"; and

"Q' " has the same meaning as "Q"; and

(B) an alumoxane.